

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1-24. (Cancelled)

25. (Currently Amended) A system for thermally mapping a vessel wall in the body of a patient, comprising:

an elongated member suitable for insertion in a vessel of a body of a patient, the elongated member having a proximal and a distal end;

an expansion device disposed at or about the distal end of the elongated member;

at least one thermal sensor capable of detecting relatively small temperature variations on the vessel wall, the at least one thermal sensor disposed on the expansion device wherein the expansion device is thereby capable of positioning the at least one thermal sensor against the vessel wall;

an ultrasonic imaging arrangement disposed on or about the distal end of the elongated member;

a control circuitry which receives and processes signals from the at least one thermal sensor and the ultrasonic imaging arrangement and merges the signals to generate an image of a portion of the vessel wall; and

a display coupled to the control circuitry and arranged to receive the merged signals ~~information from the thermal sensor~~ and to graphically display the image of the portion of the vessel

wall, wherein the image comprises a thermal map showing temperature variations along a the portion of the vessel wall.

26. (Previously Presented) The system of claim 25 wherein the at least one thermal sensor comprises a plurality of thermal sensors arranged in a band disposed about the distal section of the elongate shaft.

27. (Previously Presented) The system of claim 25 wherein the at least one thermal sensor is selected from the group consisting of an infrared sensor, a thermocouple and a thermistor.

28. (Previously Presented) The system of claim 25 wherein the graphical display of the thermal map is color coded such that temperature of tissue graphically displayed is indicated by the color of the tissue on the display.

29. (Cancelled)

30. (Currently Amended) The system of claim ~~29~~ 25 wherein the ultrasonic imaging arrangement comprises an ultrasonic transducer.

31. (Previously Presented) The system of claim 30 wherein the ultrasonic imaging arrangement comprises a rotatable ultrasonic imaging transducer coupled to a rotatable shaft that extends proximally to the proximal end of the elongate flexible member.

32. (Currently Amended) The system of claim ~~29~~ 25 wherein the at least one thermal sensor and the ultrasonic imaging arrangement are disposed adjacent each other.

33. (Previously Presented) The system of claim 25 further comprising at least a first flow altering member on the elongated member adjacent the at least one thermal sensor.

34. (Previously Presented) The system of claim 33 further comprising at least a second flow altering member on the elongated member adjacent the at least one thermal sensor, the at least one thermal sensor being positioned on the elongated member between the first flow altering member and the second flow altering member.

35. (Previously Presented) The system of claim 25 wherein the expansion device is a radially expansible balloon.

36. (Currently Amended) A system for thermally mapping a vessel wall in the body of a patient, comprising:

an elongated member suitable for insertion in a vessel of a body of a patient, the elongated member having a proximal and a distal end;

an expansion device disposed at or about the distal end of the elongated member;

at least one thermal sensor capable of detecting relatively small temperature variations on the vessel wall, the at least one thermal sensor disposed on the expansion device wherein the expansion device is thereby capable of positioning the at least one thermal sensor against the vessel wall;

an ultrasonic imaging arrangement disposed on or about the distal end of the elongated member; and

a control circuitry which receives and processes a thermal signal from the at least one thermal sensor and an imaging signal from the ultrasonic imaging arrangement, and merges the signals to generate an image of a portion of the vessel wall; and

~~a display coupled to the control circuitry and arranged to receive and merge the imaging signal with the thermal signal from the thermal sensor and to graphically display the image of the portion of the vessel wall a thermal map showing temperature variations along a portion of the vessel wall.~~

37. (Previously Presented) The system of claim 36 wherein the at least one thermal sensor is selected from the group consisting of an infrared sensor, a thermocouple and a thermistor.

38. (Previously Presented) The system of claim 36 wherein the at least one thermal sensor comprises a plurality of thermal sensors arranged in a band disposed about the distal section of the elongate shaft.

39. (Previously Presented) The system of claim 36 wherein the ultrasonic imaging arrangement comprises an ultrasonic transducer.

40. (Previously Presented) The system of claim 39 wherein the ultrasonic imaging arrangement comprises a rotatable ultrasonic imaging transducer coupled to a rotatable shaft that extends proximally to the proximal end of the elongate flexible member.

41. (Previously Presented) The system of claim 36 wherein the at least one thermal sensor and the ultrasonic imaging arrangement are disposed adjacent each other.

42. (Previously Presented) The system of claim 36 wherein the expansion device is  
a radially expansible balloon.

43-44. (Cancelled).